REMARKS

Claim 1-18 are in this application.

Claim 1 has been amended to insert "and a photocatalytic activity" in the preamble of the claim. Support for this amendment is found on page 4, line 3 of the specification. Claim 13 is being amended to depend from claim 1. Claim 18 is new. Support for this claim amendment is found on page 9, line 15 of the specification.

According to the action, claims 1, 3-10 and 12 are rejected as being an anticipated by Rohr (US 5,445,970). Claim 2 is rejected as being obvious over the combination of Rohr (US 5,445,970) and Mochizuki (US 6,203,955). Claim 11 is rejected as being obvious over the combination of Rohr (US 5,445,970 and Handy (6,997,863). Claims 13-15 are rejected as being obvious over the combination of Rohr (US 5,445,970) and Strober (US 5,985,656) and Claims 16 and 17 are rejected as being obvious over the combination of Rohr (US 5,445,970) and Kraus, Jr. (US 6,470,220). These are respectfully traversed.

Anticipation requires that each and every element of the claimed invention be disclosed in a single prior art reference. *In re Paulsen*, 30 F.3d 1475, 31 USPQ 1671 (Fed. Cir. 1994). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 1001 (Fed. Cir. 1991). As is

explained below, Rohr does not disclose all of the elements of claims 1, 3-10 and 12 and therefore, this reference does not anticipate these claims.

As set out on page 2 of the action, the Examiner states that "Rohr teaches magnetic oxide particles such as titanium oxides (see col. 11, line 58-59) coated with a hydrophilic polymer such as methylacrylamide (see col. 12, line 49)", concluding that "it is inherent that the carboxyl group of the polymer binds to the hydroxyl group of the titanium oxides via an ester linker since Rohr teaches the . same composition."

However, the Examiner's view is unreasonable because it is based on misunderstanding of the disclosure of the Rohr reference. This misunderstanding is caused by improper combination of the description in col. 11, line 58-59 and that in col. 12, line 49. Specifically, what is disclosed around col. 11, line 58-59 is "a continuous phase of a water-insoluble polymeric matrix having dispersed (embedded) therein: a magnetically attractable material, and a particulate absorbent material (selected from ... oxides of ... titanium...)" (emphasis added, see col. 11, line 51-64). In other words, Rohr teaches that the polymer matrix needs to be "water-insoluble" when titanium oxide is employed. On the other hand, methylacrylamide polymer disclosed in col. 12, line 49 is "water-soluble" as the Examiner admits. Accordingly, methylacrylamide polymer disclosed in col. 12, line 49 cannot be employed as a water-insoluble polymeric matrix mentioned in col. 11, line 58-59 due to its opposite properties in water-solubility. Thus, Rohr fails to teach or suggest the same composition, in particular a combination of titanium dioxide and a hydrophilic polymer as recited in claim 1, and teaches away from the present invention. Please note that, although the Examiner refers to "co-

polymer matrix" in column 11, line 16 and "a water-soluble polymer" in column 11, line 32 in relation to claim 7, the composite particles disclosed around column 11, lines 16-48 are directed to particles without containing titanium oxide, thus are not relevant to the present invention.

In addition, the particulate absorbent material such as titanium oxide disclosed in col. 11, line 58-59 is dispersed (embedded) in a water-insoluble polymeric matrix with a magnetically attractable material. The water-insoluble polymer forms a "matrix"embedding a particulate absorbent material therein, rather than modifying the surface of the particles as recited in claim 1. The particulate absorbent material such as titanium dioxide embedded in the water-insoluble polymeric matrix would have difficulty exhibiting photocatalytic activity as recited in amended claim 1 since the water-insoluble polymeric matrix would cover all over the surface of particulate absorbent material to inhibit the photocatalytic activity.

In contrast, the titanium dioxide composite according to the present invention can have "a molecular recognition capacity", while exhibiting "a photocatalytic activity" (see amended claim 1 and page 3, line 34 to page 4, line 4 of these properties). With these properties, the titanium dioxide composite according to the present invention can bind specifically to a target molecule of endocrine disrupting chemicals, etiological substances, cancer cells or the like, and can degrade these targets (see page 4, lines 6 to 31; and Examples 9 and 11). In addition, the titanium dioxide composite according to the present invention enables preparation of a "homogenous and stable dispersion liquid" in water, various pH buffer solutions, transfusions,

or physiological saline (see page 9, lines 25-29; and Examples 2, 3, 4, 6 and 8). These benefits can be provided by modifying a surface of the titanium oxide with a hydrophilic polymer having carboxyl groups through an ester linkage and immobilizing a molecule having a binding capacity specific for a target molecule on the remaining carboxyl groups as recited in claim 1. Neither such unique structure nor benefits provided thereby are taught or suggested by Rohr.

Indeed, Rohr is totally silent on formation of a direct linkage between the titanium oxide and the hydrophilic polymer without a linker agent intervening between them. According to the common technical knowledge among those skilled in the art, mere coexistence of carboxylic group and hydroxyl group does not naturally form an ester linkage. It would be therefore reasonable to consider that no such direct ester linkage is formed in the composite particle of Rohr. The direct linkage between the titanium oxide and the hydrophilic polymer contributes to superior dispersion stability due to strong binding force provided by the ester linkage. This leads to simultaneous realization of a "molecular recognition capacity" and a "photocatalytic activity" (see amended claim 1 and page 3, line 34 to page 4, line 4), enabling selective decomposition by the photocatalytic activity of the titanium dioxide. This unique benefit cannot be attained by a composite particle simply comprising a water-insoluble polymer matrix embedding therein a magnetically attractive material, a particulate absorbent material such as titanium dioxide, with no such ester linkage, as in the Rohr reference. Clearly, Rohr does not teach nor suggest that the surface of titanium dioxide is modified. According to column 11 of Rohr, the particular absorbent material is dispersed or embedded within the

water insoluble matrix. This even with the disclosure in column 12 referred to above does not disclose nor suggest modification of titanium dioxide.

Accordingly, Rohr fails to teach or suggest the composition and particle structure as well as the molecular recognition capacity and the photocatalytic activity as recited in claim 1.

Mochizuki discloses rutile/anatase mixed crystal type titanium oxide (see column 1, lines 63-66). However, the titanium oxide is treated to have "hydrophobicity" (see column 1, lines 63-66), which is the opposite from the property of the "hydrophilic polymer" as recited in claim 1. Thus, Mochizuki fails to disclose or suggest the present invention, teaching away from the present invention.

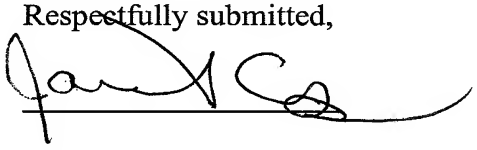
Handy, Strober and Kraus, Jr. are irrelevant to the present invention since these cited references are totally silent on a titanium dioxide and its photocatalytic activity as recited in claim 1.

According to the U.S. Supreme Court in KSR v Teleflex and as included in the Examination Guidelines for Determining Obviousness Under 35 USC 103 "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Since this has not been shown in respect of the combination of references, it is respectfully requested that the rejections obviousness rejections be withdrawn.

Therefore, it is respectfully requested that since the claims are neither anticipated nor obvious that these rejections be withdrawn.

Applicants submit that the present application is in condition for allowance and favorable consideration is respectfully requested.

Respectfully submitted,



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